

Claims defining the Invention:

1. A reinforced soil retaining wall system comprising:
a plurality of blocks arranged in courses above a base course to form a
5 wall, the wall having a retained side and a dredge side, each block comprising a front
face oriented in use towards the dredge side of the wall, a rear face spaced from said
front face by a distance defining the depth of said block and oriented in use towards
the retained side of the wall, a top surface, a bottom surface spaced from said top
10 surface by a distance defining the height of said block, opposing side surfaces spaced
from each other by a distance defining the width of said block, and a passage
extending through at least a portion of the height of the block and terminating in a first
opening in the top or bottom surface, the passage and first opening configured to
receive a first portion of a length of strip reinforcement; and,
a plurality of lengths of strip reinforcement for anchoring the wall, each
15 length of strip reinforcement insertable within at least one of the plurality of blocks such
that a first portion of the length of strip reinforcement is received within the passage of
the block, a second portion of the length of strip reinforcement is arranged in coplanar
alignment with the top or bottom surface of the block and a third portion of the length
of strip reinforcement is arranged to extend outwardly from the rear face of the block
20 and secured in position substantially perpendicular to the wall during backfilling and
compaction.
2. The reinforced soil retaining wall system of claim 1 wherein the passage
is substantially vertically oriented relative to the top or base section of the block.
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3. The reinforced soil retaining wall system of claim 1 or 2 wherein each
length of strip reinforcement is resiliently flexible.
4. The reinforced soil retaining wall system of any one of claims 1 to 3
30 wherein the block further comprises a guide slot extending from the first opening
passage along the top or bottom surface of the block, the guide slot terminating at the
rear face of the block and configured to house the second portion the length of strip
reinforcement.

5. The reinforced soil retaining wall system of any one of claims 1 to 4 wherein the third portion of the length of strip reinforcement is arranged in coplanar alignment with the top and or base surface of the blocks immediately prior to backfilling and compacting.
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6. The reinforced soil retaining wall system of any one of claims 1 to 5 wherein the passage extends through the full height of the block from a first opening provided in the bottom surface of the block to a second opening provided in the top surface of the block.
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7. The reinforced soil retaining wall system of claim 6 wherein a length of strip reinforcement is inserted through the passage from the first opening to the second opening and a fourth portion of the length of strip reinforcement is arranged to extend outwardly from the rear face of the block to be secured in position substantially
- 15 perpendicular to the wall during backfilling and compaction.
8. The reinforced soil retaining wall system of claim 7 wherein the fourth portion is arranged in general coplanar alignment with respect to the top or bottom face of the block away from the wall immediately prior to backfilling and compaction.
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9. The reinforced soil retaining wall system of any one of claims 1 to 8 wherein the passage is a cavity extending from the bottom surface to the top surface, the cavity configured to receive a quantity of ballast.
- 25
10. The reinforced soil retaining wall system of claim 10 wherein the ballast is drainage aggregate.
11. The reinforced soil retaining wall system of claim 10 wherein the ballast is impermeable.
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12. The reinforced soil retaining wall system of any one of claims 1 to 11 wherein the passage is one of plurality of passages.
13. The reinforced soil retaining wall system of any one of claims 1 to 12

further comprising one or more shear pins to resist sliding movement of a first course over an adjacent second course.

14. The reinforced soil retaining wall system of any one of claims 1 to 13
5 further comprising a drainage channel configured to direct moisture from the retained side of the wall towards the dredge side of the wall.

15. The reinforced soil retaining wall system of any one of claims 1 to 14
10 wherein the plurality of lengths of strip reinforcement are divided into a threaded section inserted into at least one block and a free section co-operatively associated with the threaded section and arranged to extend outwardly from the rear face of the block and be secured in position substantially perpendicular to the wall during backfilling and compaction.

15 16. The reinforced soil retaining wall system of any one of claims 1 to 15 forming a lower section of a composite wall, the composite wall being divided a transition depth into an upper section and the lower section

17. The reinforced soil retaining wall system of claim 16 wherein the upper
20 section is a gravity retaining wall.

18. The reinforced soil retaining wall system of claim 16 or 17 further
comprising a soil reinforcement protection barrier at the transition depth in general
coplanar alignment with the top uppermost course of blocks forming the lower section
25 of the composite wall.

19. The reinforced soil retaining wall system of claim 18 wherein the soil
reinforcement protection barrier is a concrete slab.

30 20. A method of construction of a reinforced soil retaining wall system, the system comprising a plurality of blocks arranged in courses above a base course to form a wall, the wall being anchored by backfilling and compacting soil over a plurality of lengths of strip reinforcement operatively connected to at least a portion of the plurality of blocks laid in courses, the method of construction comprising the steps of:

5 a) providing a level surface for laying a course of blocks, each block comprising a front face, a rear face spaced from said front face by a distance defining the depth of said block, a top surface, a bottom surface spaced from said top surface by a distance defining the height of said block, opposing side surfaces spaced from each other by a distance defining the width of said block, a passage extending through at least a portion of the height of the block and terminating in a first opening in the top or bottom surface, the passage and first opening configured to receive a first portion of a length of strip reinforcement;

10 b) inserting a length of strip reinforcement into a block to be laid in the course such that a first portion of the length of strip reinforcement is received in the passage, a second portion of the length of strip reinforcement is arranged in coplanar alignment with the top or bottom surface of the block and a third portion of the length of strip reinforcement is arranged to extend outwardly from the rear face of the block;

15 c) positioning the block and the inserted length of strip reinforcement onto the level surface such that the rear surface of the block and the third portion of the length of strip reinforcement is directed towards the soil to be retained by the wall;

d) repeating step (a) to (c) until a required height for the retaining wall has been achieved; and,

20 e) anchoring the position of the third portion of the length of strip reinforcement by backfilling and compacting a quantity of soil behind the rear face of the block.

21. The method of construction of claim 20 wherein step (e) is conducted after step (c) after each course is completed.

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22. The method of construction of claim 20 or 21 wherein construction is mortarless and each block further comprises a guide slot extending from the first opening along the bottom surface of the block and terminating at the rear face of the block, the guide slot being configured to accommodate the second portion the length of strip reinforcement.

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23. The method of construction of any one of claims 20 to 22 wherein the third portion of the length of strip reinforcement is arranged in coplanar alignment with the top and or base surface of the blocks immediately prior to step (e).

24. The method of construction of any one of claims 20 to 23 wherein the passage extends through the full height of the block from a first opening provided in the bottom surface of the block to a second opening provided in the top surface of the block and step (b) comprises the step of inserting a length of strip reinforcement through the passage from the first opening to the second opening such that a fourth portion of the length of strip reinforcement is arranged to extend outwardly from the rear face of the block.
25. The method of construction of claim 24 wherein step (e) further comprises the step of anchoring the position of the fourth portion of the length of strip reinforcement by backfilling and compacting a quantity of soil behind the rear face of the block.
26. The method of construction of claim 25 wherein the fourth portion is arranged in general coplanar alignment with respect to the top or bottom face of the block away from the wall immediately prior to backfilling and compaction.
27. The method of construction of any one of claims 20 to 26 wherein the passage is a cavity extending from the bottom surface to the top surface and the method further comprises the step of adding a quantity of ballast to the cavity after each block or each course of blocks has been laid.
28. The method of construction of claim 27 wherein the ballast is drainage aggregate.
29. The method of construction of claim 27 wherein the ballast is impermeable.
30. The method of construction of any one of claims 20 to 29 further comprising the step of installing one or more shear pins to resist sliding movement of a first course over an adjacent second course.
31. The method of construction of any one of claims 20 to 30 wherein the

plurality of lengths of strip reinforcement are divided into a threaded section inserted into at least one block at step (b) and a free section co-operatively associated with the threaded section and arranged to extend outwardly from the rear face of the block and be secured in position during step (e) substantially perpendicular to the wall during
5 backfilling and compaction.

32. The method of construction of any one of claims 20 to 31 wherein the reinforced soil retaining wall forms a lower section of a composite wall, the composite wall being divided a transition depth into an upper section and the lower section and
10 the method further comprises the step of constructing a gravity or cantilever retaining wall to form the upper section of the composite wall.

33. The method of construction of claim 32 further comprising the step of installing a soil reinforcement protection barrier at the transition depth in general
15 coplanar alignment with the top uppermost course of blocks forming the lower section of the composite wall.

34. The method of construction of claim 33 wherein the step of installing a soil reinforcement protection barrier comprises the step of laying a concrete slab.
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35. A block for use in constructing the reinforced soil retaining wall system of any one of claims 1 to 19.

36. A length of strip reinforcement for use in constructing the reinforced soil retaining wall system of any one of claims 1 to 19.
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37. A reinforced soil retaining wall system comprising:
a plurality of blocks arranged in courses above a base course to form a wall, the wall having a retained side and a dredge side, each block comprising a front
30 face oriented in use towards the dredge side of the wall, a rear face spaced from said front face by a distance defining the depth of said block and oriented in use towards the retained side of the wall, a top surface, a bottom surface spaced from said top surface by a distance defining the height of said block, opposing side surfaces spaced from each other by a distance defining the width of said block;

a first plurality of sections of soil reinforcement for anchoring the wall to the backfill, the first plurality of sections of soil reinforcement arranged between adjacent courses of the wall and extending outwardly from the rear face of the blocks on the retained side of the wall; and,

5 a second plurality of sections of soil reinforcement for stabilizing a quantity of backfilled and compacted soil on the retained side of the wall, the second plurality of sections of soil reinforcement being spaced apart from the first plurality of sections of soil reinforcement and arranged to extend substantially perpendicular to the wall during backfilling and compaction.

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38. The reinforced soil retaining wall system of claim 37 wherein the second plurality of sections of soil reinforcement is spaced apart from the rear face of the wall.

39. The reinforced soil retaining wall system of claim 37 or 38 wherein one
15 or both of the first or second plurality of sections soil reinforcement is/are resiliently flexible.

39. The reinforced soil retaining wall system of any one of claims 37 to 38
20 wherein the wall has a height and the plurality of second sections of soil reinforcement have a length that is equal to at least 60% of the height of the wall.

40. The reinforced soil retaining wall system of claim 39 wherein the wall
25 has a height and the plurality of second sections of soil reinforcement have a length that is equal to at least 70% of the height of the wall.

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41. The reinforced soil retaining wall system of claim 40 wherein the wall
 has a height and the plurality of second sections of soil reinforcement have a length
 that is equal to at least 80% of the height of the wall.

30 42. The reinforced soil retaining wall system of any one of claims 37 or 38
 wherein the plurality of second sections of soil reinforcement have a length that
 extends at least through the anticipated plane of rupture of the backfill.

43. The reinforced soil retaining wall system of any one of claims 37 to 42

wherein one or both of the first or second plurality of sections of soil reinforcement is/are planar.

44. The reinforced soil retaining wall system of any one of claims 37 to 42 wherein the one or both of the first or second plurality of sections of soil reinforcement is/are geomesh.

45. The reinforced soil retaining wall system of any one of claims 37 to 42 wherein one or both of the first or second plurality of sections of soil reinforcement is/are in the form of elongated strips.

46. The reinforced soil retaining wall system of any one of claims 37 to 45 wherein the first and second plurality of sections of soil reinforcement are arranged in horizontal coplanar arrangement with respect to each other.

47. The reinforced soil retaining wall system of any one of claims 37 to 45 wherein the first plurality of sections of soil reinforcement are arranged in a first layer and the second plurality of sections of soil reinforcement are arranged in a second layer offset from the first layer.

48. The reinforced soil retaining wall system of any one of claims 37 to 47 wherein one or both of the first or second plurality of sections of soil reinforcement is/are arranged in coplanar alignment with the top and or base surface of one or more of the plurality of blocks immediately prior to backfilling and compacting.

49. The reinforced soil retaining wall system of any one of claims 37 to 48 wherein the blocks further comprise one or more cavities extending from the bottom surface to the top surface, the cavity configured to receive a quantity of ballast.

50. The reinforced soil retaining wall system of claim 49 wherein the ballast is drainage aggregate.

51. The reinforced soil retaining wall system of claim 50 wherein the ballast is impermeable.

52. The reinforced soil retaining wall system of any one of claims 37 to 51 further comprising one or more shear pins to resist sliding movement of a first course over an adjacent second course.
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53. The reinforced soil retaining wall system of any one of claims 37 to 52 further comprising a drainage channel configured to direct moisture from the retained side of the wall towards the dredge side of the wall.
- 10 54. The reinforced soil retaining wall system of any one of claims 37 to 53 forming a lower section of a composite wall, the composite wall being divided a transition depth into an upper section and the lower section.
- 15 55. The reinforced soil retaining wall system of claim 54 wherein the upper section is a gravity retaining wall.
- 20 56. The reinforced soil retaining wall system of claim 54 or 55 further comprising a soil reinforcement protection barrier at the transition depth in general coplanar alignment with the top uppermost course of blocks forming the lower section of the composite wall.
57. The reinforced soil retaining wall system of claim 56 wherein the soil reinforcement protection barrier is a concrete slab.
- 25 58. The reinforced soil retaining wall system of any one of claims 37 to 57 wherein the first plurality of sections of soil reinforcement are fixedly held between adjacent courses of blocks using mortar.
- 30 59. The reinforced soil retaining wall system of any one of claims 37 to 57 wherein the first plurality of sections of soil reinforcement are fixedly held between adjacent courses of blocks by gravity under the weight of the blocks forming the adjacent courses.
60. A method of construction of a reinforced soil retaining wall system, the

system comprising a plurality of blocks arranged in courses above a base course to form a wall, the method of construction comprising the steps of:

- 5 a) providing a level surface for laying a course of blocks, each block comprising a front face, a rear face spaced from said front face by a distance defining the depth of said block, a top surface, a bottom surface spaced from said top surface by a distance defining the height of said block, opposing side surfaces spaced from each other by a distance defining the width of said block;
- 10 b) arranging a first plurality of sections of soil reinforcement for anchoring the wall to the backfill between adjacent courses of the wall whilst laying each course of blocks, the first plurality of sections of soil reinforcement being arranged to extend outwardly from the rear face of the blocks on the retained side of the wall;
- c) laying each subsequent course until a required height for the retaining wall has been achieved;
- 15 d) arranging a second plurality of sections of soil reinforcement spaced apart from the first plurality of sections of soil reinforcement and arranged to extend during step (e) substantially perpendicular to the wall; and,
- (e) backfilling and compacting a quantity of backfill behind the rear face of the blocks so as to anchor the position of the first and second plurality of sections of soil reinforcement.
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61. The method of construction of claim 60 wherein step (e) is conducted after step (b) and prior to step (c).

25 62. The method of construction of claim 61 or 62 wherein the second plurality of sections of soil reinforcement are arranged during step (e) so as to be spaced apart from the rear face of the wall.

63. The method of construction of any one of claims 60 to 62 wherein the first and second plurality of sections of soil reinforcement are arranged in horizontal coplanar arrangement with respect to each other.

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64. The method of construction of any one of claims 60 to 62 wherein the first plurality of sections of soil reinforcement are arranged in a first layer and the

second plurality of sections of soil reinforcement are arranged in a second layer offset from the first layer.

5 65. The method of construction of any one of claims 60 to 64 wherein one or both of the first or second plurality of sections of soil reinforcement is/are arranged in coplanar alignment with the top and or base surface of one or more of the plurality of blocks immediately prior to backfilling and compacting.

10 66. The method of construction of any one of claims 60 to 65 wherein the blocks further comprise one or more cavities extending from the bottom surface to the top surface, the cavity configured to receive a quantity of ballast and the method further comprises the step of adding a quantity of ballast to the cavity after each block or each course of blocks has been laid.

15 67. The method of construction of claim 66 wherein the ballast is drainage aggregate.

20 68. The method of construction of claim 66 wherein the ballast is impermeable.

69. The method of construction of any one of claims 60 to 68 further comprising the step of installing one or more shear pins to resist sliding movement of a first course over an adjacent second course.

25 70. The method of construction of any one of claims 60 to 69 wherein the reinforced soil retaining wall forms a lower section of a composite wall, the composite wall being divided a transition depth into an upper section and the lower section and the method further comprises the step of constructing a gravity or cantilever retaining wall to form the upper section of the composite wall.

30 71. The method of construction of claim 70 further comprising the step of installing a soil reinforcement protection barrier at the transition depth in general coplanar alignment with the top uppermost course of blocks forming the lower section of the composite wall.

72. The method of construction of claim 71 wherein the step of installing a soil reinforcement protection barrier comprising the step of laying a concrete slab.

5 73. The method of construction of any one of claims 60 to 72 wherein the first plurality of sections of soil reinforcement are fixedly held between adjacent courses of blocks using mortar.

10 74. The method of construction of any one of claims 60 to 72 wherein the first plurality of sections of soil reinforcement are fixedly held between adjacent courses of blocks by gravity under the weight of the blocks forming the adjacent courses.

15 75. A block for use in constructing the reinforced soil retaining wall system of any one of claims 1 to 19.

76. A length of strip reinforcement for use in constructing the reinforced soil retaining wall system of any one of claims 1 to 19.

20 77. A reinforced soil retaining wall system substantially as herein described with reference to and as illustrated in the accompanying illustrations.

25 78. A method of construction of a reinforced soil retaining wall system substantially as herein described with reference to and as illustrated in the accompanying illustrations.

79. A block for use in the construction of a reinforced soil retaining wall system substantially as herein described with reference to and as illustrated in the accompanying illustrations.

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80. A length of strip reinforcement for use in the construction of a reinforced soil retaining wall system substantially as herein described with reference to and as illustrated in the accompanying illustrations.

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